

10/597491

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
11 August 2005 (11.08.2005)

PCT

(10) International Publication Number  
**WO 2005/074005 A3**

(51) International Patent Classification:  
*C09K 11/78* (2006.01) *C09K 11/81* (2006.01)  
*C09K 11/80* (2006.01) *H01J 61/44* (2006.01)

10510-8001 (US). CARTER, Brett [US/US]; P.O. Box 3001, Briarcliff Manor, New York 10510-8001 (US).

(21) International Application Number:  
PCT/IB2005/050370

(74) Common Representative: KONINKLIJKE PHILIPS ELECTRONICS, N.V.; c/o Frank Keegan, P.O. Box 3001, Briarcliff Manor, New York 10510-8001 (US).

(22) International Filing Date: 27 January 2005 (27.01.2005)

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/540,707 30 January 2004 (30.01.2004) US

(71) Applicant (for all designated States except US): KONINKLIJKE PHILIPS ELECTRONICS, N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

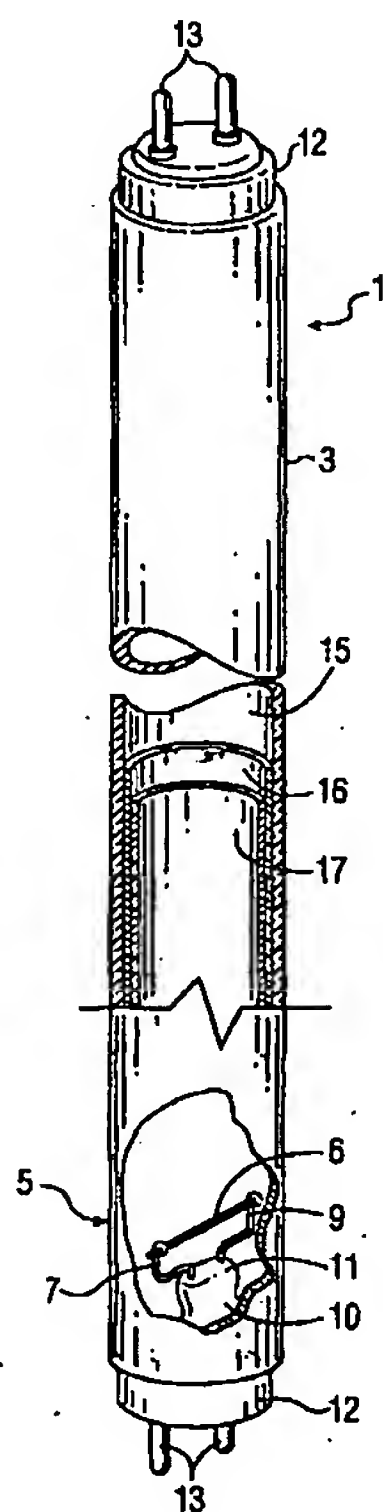
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,

(72) Inventors; and  
(75) Inventors/Applicants (for US only): SIGAI, Gary [US/US]; P.O. Box 3001, Briarcliff Manor, New York

[Continued on next page]

(54) Title: LOW PRESSURE MERCURY VAPOR FLUORESCENT LAMPS

(57) Abstract: A low mercury consumption electric lamp is provided having a layer of a luminescent material comprising a phosphor derived from a mixture of a mixture of a cool-white calcium halophosphate, a red-emitting yttrium oxide (YOX), a green-emitting cerium, terbium lanthanum phosphate (LAP), and a blue-emitting europium-activated barium magnesium hexa-aluminate (BAM).



WO 2005/074005 A3



FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,  
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,  
GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments*

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a  
patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the  
earlier application (Rule 4.17(iii))*

(88) Date of publication of the international search report:  
29 June 2006

**Published:**

- *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

IB2005/050370

## A. CLASSIFICATION OF SUBJECT MATTER

INV. C09K11/78 C09K11/80 C09K11/81 H01J61/44

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C09K H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 339 093 A (GENERAL ELECTRIC COMPANY) 27 August 2003 (2003-08-27) paragraphs [0001], [0003], [0009], [0010], [0016], [0018], [0028], [0033], [0041] claims 1-10	1-13
A	US 5 714 836 A (HUNT ET AL) 3 February 1998 (1998-02-03) examples 1-3 tables 1-3 claims 1-27	1-13
A	EP 0 067 030 A (KABUSHIKI KAISHA TOSHIBA) 15 December 1982 (1982-12-15) page 5, line 3 - line 14 table 2 claims 1-8	1-13
	-/--	



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

24 April 2006

Date of mailing of the international search report

03/05/2006

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Kövecs, M

## INTERNATIONAL SEARCH REPORT

IB2005/050370

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/076029 A1 (GRUBER WOLFGANG ET AL) 24 Apr11 2003 (2003-04-24) claims 1-19 -----	1-13

**Box II Observations where certain claims were found unsearchable (Continuation of Item 2 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box III Observations where unity of invention is lacking (Continuation of Item 3 of first sheet)**

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1,4-11

An electric lamp comprising a calcium halophosphate, an yttrium oxide (YOX), a cerium terbium lanthanum phosphate (LAP) and an europium barium magnesium aluminate (BAM) (claim 1,4-11).  
---

2. claims: 2,12

An electric lamp comprising a calcium halophosphate, an yttrium oxide (YOX), a cerium terbium magnesium aluminate (CAT) or a cerium terbium gadolinium pentaborate (CBT) and an europium barium magnesium aluminate (BAM) (claim 2,12).  
---

3. claims: 3,13

An electric lamp comprising a calcium halophosphate, an yttrium oxide (YOX), a cerium terbium lanthanum phosphate (LAP) and an europium chloro strontium calcium barium phosphate (SCA) or an europium strontium chloroapatite (SCAP) (claim 3,13).  
---

## INTERNATIONAL SEARCH REPORT

IB2005/050370

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1339093	A	27-08-2003	CN 1440046 A	03-09-2003
			JP 2003282026 A	03-10-2003
			US 2003155857 A1	21-08-2003
US 5714836	A	03-02-1998	CA 2105021 A1	01-03-1994
EP 0067030	A	15-12-1982	AU 535656 B2	29-03-1984
			AU 8463282 A	23-12-1982
			CA 1184966 A1	02-04-1985
			DE 3277151 D1	08-10-1987
			JP 2017908 B	23-04-1990
			JP 57202638 A	11-12-1982
			KR 8600818 B1	28-06-1986
US 2003076029	A1	24-04-2003	CA 2409289 A1	23-04-2003
			DE 10152217 A1	30-04-2003
			EP 1306885 A2	02-05-2003
			JP 2003193046 A	09-07-2003